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ABSTRACT

This literature review addresses the question of whether or not children, adolescents, and adults with Attention Deficit Hyperactivity Disorder (ADHD) and the parents of those with ADHD have lowered self-esteem when compared to children, adolescents, and adults without ADHD and the parents of children without ADHD. The research is inconclusive on the self-esteem of children, with more research needed in this area. Adolescents and adults with ADHD, however, were found to have lower self-esteem than those without this disorder. Parents of children with ADHD who had comorbid symptoms were found to feel less competent in their parenting roles than the parents of children without ADHD. Lastly, the research supports the use of multimodal treatment programs to increase the self-esteem of children with ADHD, but further research is necessary to determine the longitudinal effects of this type of treatment. (Contains 30 references.) (Author/CR)

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SELF-ESTEEM WITHIN CHILDREN, ADOLESCENTS, AND ADULTS DIAGNOSED WITH ATTENTION-DEFICIT HYPERACTIVITY DISORDER: A REVIEW OF THE LITERATURE

A Doctoral Research Paper

Presented to

the Faculty of the Rosemead School of Psychology

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In Partial Fulfillment

of the Requirements for the Degree

Doctor of Psychology

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by

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ABSTRACT

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This literature review addresses the question of whether or not children, adolescents, and adults with Attention-Deficit Hyperactivity Disorder (ADHD), and the parents of those with ADHD have lowered self-esteem when compared to those children, adolescents, and adults without ADHD, and the parents of those without ADHD. The research is inconclusive regarding the self-esteem of children, requiring more research in this area. Adolescents and adults with ADHD, however, were found to have lower self-esteem than those without the disorder. Parents of children with ADHD and comorbid symptoms were found to feel less competent in their parenting roles than the parents of children without ADHD. Lastly, the research supports the use of multimodal treatment programs to increase the self-esteem of children with ADHD, but further

research is necessary to determine the longitudinal effects of this type of treatment.

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SELF-ESTEEM WITHIN CHILDREN, ADOLESCENTS, AND ADULTS DIAGNOSED WITH ATTENTION-DEFICIT HYPERACTIVITY DISORDER: A REVIEW OF THE LITERATURE

Introduction

Disruptive behavior disorders, such as Attention-Deficit Hyperactivity Disorder (ADHD), Oppositional Defiant Disorder (ODD), and Conduct Disorder (CD), are the most common reasons children are referred to mental health clinics (Frick & Lahey, 1991; Grizenko, Papineau, & Sayegh, 1993a; Slomkowski, Klein, & Mannuzza, 1995). It has been reported that approximately 50% of the children referred to psychiatric treatment have a diagnosis of ADHD (Dooling-Litfin & Rosen, 1997; Frick & Lahey, 1991).

Over the past 20 years, the definition of ADHD has undergone several revisions. These revisions have made it difficult to determine the actual number of children affected by this disorder. Estimates of occurrence in the school-aged population have ranged from 1% to 20%, depending on the standards used to define the disorder (Frick & Lahey, 1991; Kottman, Robert, & Baker, 1995). Current sources suggest that in the United States, 3% to 5% of the childhood

population has ADHD (Alston & Romney, 1992; Barkley, Anastopoulos, Guevremont, & Fletcher, 1991; Dooling-Litfin & Rosen, 1997; Johnston, 1996) and according to the Diagnostic and Statistical Manual of Mental Disorders (4th ed.) (DSM-IV; American Psychiatric Association, 1994), boys are four to nine times more likely than girls to display symptoms of the disorder.

Contrary to previous expectations, this disorder is not limited to childhood, and its symptoms do not necessarily vanish with time. It is estimated that as many as 30% to 80% of adolescents meet the criteria for ADHD (Barkley et al., 1991; Slomkowski et al., 1995). Additionally, follow-up studies have concluded that 30% to 50% of those diagnosed with childhood ADHD become adults with ADHD (Biederman et al., 1993). It has also been found that in as many as 70% of ADHD children, the effects of the disorder continue into adulthood (Dooling-Litfin & Rosen, 1997).

Children diagnosed solely with ADHD have become an increasing rarity. Comorbidity with other disorders is often the case in ADHD children. As many as 35% of children with ADHD are also diagnosed with Oppositional Defiant Disorder (ODD) and in 30% to 50% of the cases, Conduct Disorder (CD) is found to coexist (Kuhne, Schachar, & Tannock, 1997).

Aside from manifesting the characteristic symptoms of ADHD, many of these children also display a low self-esteem and have a poor self-concept that they seem to carry into adolescence and even adulthood (Frick & Lahey, 1991).

Hence, this literature review attempts to address the following question: Do children, adolescents, and adults with ADHD, and the parents of those with ADHD have lowered self-esteem when compared to those children, adolescents, and adults without ADHD, and the parents of those without ADHD? Before reviewing the literature regarding self-esteem issues, it is important to understand how one arrives at the diagnosis of ADHD, what constitutes self-esteem, and what are the methodological considerations that exist within the current literature.

Origin and Definition of ADHD

The conceptualization and description of ADHD has undergone several changes throughout the years. It was originally believed that the disorder was due to a malfunction of the central nervous system, and the hyperactive child was subsequently referred to as having minimal brain damage. This label was changed to minimal brain dysfunction because the nature and location of the brain damage was indeterminate. Later, as a means of emphasizing the predominant behavioral aspect of the condition and minimizing the unascertained origin of the disorder, the name was again changed to hyperactive child syndrome or hyperkinetic reaction to childhood (Cramond, 1994).

In 1980, with the publication of the Diagnostic and Statistical Manual of Mental Disorders (3rd ed.) (DSM-III; American Psychiatric Association, 1980), the focus shifted to the attentional difficulties of children displaying this syndrome,

rather than their hyperactive behavior. The condition was again relabeled attention-deficit disorder (ADD). According to the DSM-III, it was possible for a child to manifest attention-deficits and impulsivity either with hyperactivity (ADD/H), or without hyperactivity (ADD/WO). Attentional difficulties and impulsive behavior were essential for the diagnosis of ADD, and the existence, or absence, of hyperactive behavior provided additional classification.

The publication of the revised Diagnostic and Statistical Manual of Mental Disorders (3rd ed.) (DSM-III-R; American Psychiatric Association, 1987) introduced the terms attention-deficit hyperactivity disorder (ADHD), to replace ADD/H, and undifferentiated attention-deficit disorder (UADD), in place of the former ADD/WO. UADD was also quite different from ADD/WO because it not only excluded hyperactivity, but impulsivity as well. To receive a diagnosis of ADHD, the individual would have to display 8 or more of the 14 symptoms that demonstrate problems with hyperactivity, impulsivity, and attention, and the onset of these symptoms would have to occur before age 7.

The most current publication of the DSM, the fourth edition (1994), has retained the term ADHD but has allowed the mental health professional the option of coding the disorder based on predominantly inattentive or predominantly hyperactive-impulsive symptoms. If an individual is displaying both types of symptoms, a combined type disorder is assigned. Lastly, for those individuals who manifest symptoms of inattention or hyperactivity-impulsivity

and do not meet the criteria for ADHD, the diagnosis of ADHD, Not Otherwise Specified is assigned.

As noted, the understanding and definition of ADHD has been reconceptualized numerous times throughout the years. The confusion stemming from the uncertainty of etiology and diagnosis has complicated the research process. Additionally, the research of ADHD becomes further confounded by the coexistence of other complex conditions, including disruptive behavior disorders, affective disorders, learning disabilities, and medical conditions (Cramond, 1994).

Definition of Self-Esteem

In 1990, the California Task Force to Promote Self-Esteem and Personal and Social Responsibility defined self-esteem as "appreciating [one's] own worth and importance and having the character to be accountable for [oneself] and to act responsibly toward others" (Brooks, 1994). Although this allows for a descriptive and concise definition, self-esteem is not that easily defined when it comes to research.

Self-esteem is difficult to define because of the subjective nature of the term. Self-esteem is the perception of one's own thoughts and feelings about oneself. Since the term relies on one's self-perception, it is open to a variety of interpretations based on whoever is doing the perceiving. To control the

subjectivity of the term and make it objectively measurable, researchers rely on various psychometric instruments.

By completing self-report questionnaires, individuals respond to questions designed to assess their levels of self-esteem. Likewise, observers, such as parents and teachers, have questionnaires they complete based on their perceptions of an individual's self-esteem. There are many instruments, with proven validities and reliabilities, that assess self-esteem (e.g., Coopersmith Self-Esteem Inventory, Piers-Harris Self-Concept Scale). On the other hand, researchers occasionally design their own tests to evaluate self-esteem, and these tests may or may not have known psychometric properties.

To define self-esteem, researchers rely on the scores produced on the various instruments. Usually, the higher the total score, the higher one's level of self-esteem and the lower the total score, the lower one's level of self-esteem. Sometimes, the reverse is true, meaning that higher scores indicate lower levels of self-esteem. To interpret the test results, one would need to be familiar with the specific test manual.

Methodological Considerations

Within the current body of research on ADHD and self-esteem, there are several methodological considerations and limitations that need mention. This section shall address such reoccurring problems as inconsistent definitions, the

use of instruments with unknown psychometric properties, small sample size, representativeness of the sample, non-random selection procedures, the absence of comparison groups, and possible reporting biases.

Inconsistent Definitions

As previously mentioned, the diagnosis of ADHD has been reshaped and renamed numerous times throughout the years. Additionally, due to its subjective nature, the term self-esteem is open to each researcher's interpretation. A recurring problem in the literature is that both ADHD and self-esteem have inconsistent definitions.

Depending on when studies of ADHD were conducted, researchers in this review relied on either the DSM-III (Alston & Romney, 1992; Slomkowski et al., 1995), the revised edition of the DSM-III (Anastopoulos, Shelton, DuPaul, & Guevremont, 1993; Barkley et al., 1991; Biederman et al., 1993; Dooling-Litfin & Rosen, 1997; Goldhaber, 1991; Grizenko, 1997; Grizenko & Sayegh, 1990; Grizenko et al., 1993a; Grizenko, Papineau, & Sayegh, 1993b; Hoza, Pelham, Milich, Pillow, & McBride, 1993; Johnston, 1996; Kuhne et al., 1997; Ratey, Greenberg, Bemporad, & Lindem, 1992; Unger, Kipke, Simon, Montgomery, & Johnson, 1997; Wright, 1995), or the DSM-IV (Bussing, Zima, Belin, & Forness, 1998; Kottman et al., 1995) when defining the term ADHD. Although each of these editions view ADHD from a slightly different perspective, each

incorporates varying combinations of inattention, impulsivity, and hyperactivity within the diagnosed individual.

In addition to the difficulty in defining ADHD, attempts to define self-esteem have been just as challenging. To begin with, self-esteem is very similar to self-concept, self-perception, self-worth, self-regard, and self-acceptance. Researchers use these terms, as well as others, interchangeably, when discussing self-esteem.

As previously discussed, researchers use various questionnaires to evaluate an individual's level of self-esteem. In most cases, a high total score indicates a greater level of self-esteem than does a low total score. Whereas high self-esteem equates with one's own sense of dignity or self-value, low self-esteem is indicative of a lack of appreciation of oneself.

Although self-esteem and ADHD have inconsistent definitions, researchers have the DSM, test scores from various reliable and valid instruments, and self-reports to help determine whether individuals with ADHD have lower self-esteem than those without the diagnosis.

Instruments with Unknown Psychometric Properties

As mentioned earlier, most of the research assessing self-esteem of individuals with ADHD, as well as self-esteem of the parents of children with this diagnosis, relies on well-constructed questionnaires with proven reliabilities

and validities. Two studies, in particular, used surveys in which the psychometric properties of the scales have not yet been published.

As a means of determining one's level of self-esteem, Slomkowski et al. (1995) used an 11-item questionnaire. The subjects rated their opinions of themselves, as compared to their peers' opinions of themselves, on a Likert scale, and a total score was established. Likewise, the subjects completed a 26-item questionnaire that listed the core symptoms of ADHD. Via self-report, the subjects rated how often these symptoms occurred over the past six months, and a total score was determined.

Kottman et al. (1995) also chose an instrument with unknown psychometric properties. The subjects completed a 25-item survey of open-ended questions entitled Parental Perspectives on Attention-Deficit Hyperactivity Disorder. This survey, designed by the ADHD research team at the University of North Texas, incorporates demographics and developmental history, in addition to parenting views and knowledge of the identification, symptomatology, and treatment of ADHD.

Even though these two studies used surveys with undetermined validities and reliabilities, valuable information was gathered from the subjects' self-reports. In fact, several researchers based their discussions about self-esteem on the self-report of the subject, observation, and parent and teacher reports (Goldhaber, 1991; Kottman et al., 1995; Ratey et al., 1992).

Self-reports are an excellent source of information. On the other hand, self-reports can be biased due to their subjective nature. It is possible for subjects to over- or under-report feelings of self-worth depending on whether they perceive themselves as experiencing high or low levels of self-esteem. As a result, researchers need to be aware of possible self-report biases.

Sample Size

Goldhaber (1991) and Grizenko and Sayegh (1990) used small subject sample sizes (N = 8, 23, respectively). Additionally, Kuhne et al. (1997) used a small subsample size (n = 12) in their study. A small sample size reduces statistical power, limiting the ability to differentiate the sample among other groups, and makes it difficult to generalize the findings to a broad population. Although these studies had small sample sizes, in the case of Kuhne et al., significant results were noted which support the assumption that differences exist between children with ADHD and CD and children with ADHD and ODD.

Representativeness of the Sample

Since males are four to nine times more likely to display symptoms of ADHD than are females, it is not surprising that more males participated in each of the studies of individuals with ADHD, than did females. In a few of the studies, the subjects were predominantly Caucasian (Anastopoulos et al., 1993; Barkley et al., 1991; Slomkowski et al., 1995) with a middle-class socioeconomic status (Anastopoulos et al., 1993; Slomkowski et al., 1995). Alston and Romney

(1992) selected only English speaking male students as their subjects. Kuhne et al. (1997) chose only clinically referred children for their study. Their research included a group of all male subjects classified as having both ADHD and CD. It is possible that the overrepresentation of males was due to a referral bias in which parents and teachers tended to anticipate and identify aggression in boys more willingly than in girls.

Slomkowski et al. (1995) selected subjects that were predominantly hyperactive, having few comorbid conditions. Therefore, the findings may not be representative of those individuals who experience hyperactivity in addition to other psychiatric problems. On the other hand, the majority of the ADHD subjects chosen by Hoza et al. (1993) had either a concurrent ODD or CD, reducing the confidence in concluding that the noted effects were mainly due to ADHD.

Lastly, the parents that participated in the Kottman et al. (1995) survey were predominantly Caucasian, educated, and in the upper socioeconomic strata. Being members of the statewide support group for ADHD parents, these individuals were likely to be more cognizant and more active with ADHD issues than were parents who did not belong to the support group. Hence, those that responded to the survey did not represent the majority of families with children with ADHD. Regardless of the composition of the various samples it is

important to remember that specific, limited samples cannot be generalized to represent the population at large.

Selection Procedures

The researchers in this review tended to use accessible subjects rather than the preferred randomly assigned subjects. The disadvantage to this selection process is that the results may not be generalizable to the population at large. Ratey et al. (1992) studied a retrospective sample from their clinical practice. Barkley et al. (1991) selected predominantly Caucasian teenagers, impeding the generalization of the findings to minority groups with ADHD. Likewise, Unger et al. (1997) studied homeless youth in Hollywood, California. Their results may not be reflective of homeless populations in other areas because the homeless youth that choose to remain in their home states may differ from those who travel to specific areas known for their homeless populations (e.g., Los Angeles, New York City).

In the study by Alston and Romney (1992), the subjects were placed into one of two groups depending on whether or not they were receiving medication from their prescribing physicians. The subjects' placements potentially impacted the study because there was no assurance that the subjects receiving medication did not differ in some important aspects from those subjects who were nonmedicated. Additionally, the outcome of the treatment may have invalidated these differences.

Grizenko et al. (1993a) assigned subjects sequentially rather than randomly to the treatment group. It is possible that the subjects who were placed on the waiting list were viewed differently by their parents and teachers than were the subjects who were referred earlier in the school year and placed in the treatment group.

Comparison Groups

Several of the researchers omitted comparison groups in their studies (Grizenko, 1997; Grizenko & Sayegh, 1990; Grizenko et al., 1993b; Ratey et al., 1992; Wright, 1995). In some cases a control group was not feasible, whereas in others, the use of a comparison group would have been unethical. The drawback of not having a control group is that any changes that are observed cannot necessarily be attributed to the independent variable. For example, when studying day treatment programs without the use of a comparison group, it is difficult to determine to what degree the positive changes can be attributed to the day treatment program. The changes may occur as an effect of maturation and the passage of time, or be due to a placebo effect (Grizenko, 1997).

Reporting Biases

It is possible that various reporting biases occurred in several of the reviewed studies. First, the interviewers and the observers in the Barkley et al. (1991) and the Biederman et al. (1993) studies were not blind to the subjects' referral status which may have introduced some bias into the findings.

Additionally, in the Biederman et al. study, the subjects were compared with pre-examined individuals. Again there was potential for reporting bias because the assessments could not be made blind to the referral status.

Second, in the Unger et al. (1997) and the Dooling-Litfin and Rosen (1997) studies, the findings may include reporting biases because the collected data were provided by self-reports. The homeless youth in Unger et al.'s research may have responded to the interviewers in a way to please or even shock them, wanted to avoid any negative consequences of reporting illegal behavior, or changed their responses out of fear of others listening in on their interviews. The subjects in Dooling-Litfin and Rosen's research self-reported whether they had previously been diagnosed with ADHD as a child, and there was no follow-up to confirm the subjects' reports.

Third, there is a chance that teacher and parent reporting biases occurred in the Alston and Romney (1992) and the Anastopoulos et al. (1993) studies. It is likely that the teachers in the Alston and Romney study formed impressions of their students within the first few weeks of school. If a student was then placed on medication, it is possible that the teachers' ratings of the student's external behavior may not have been affected, even though significant changes may have occurred. If a teacher is inaccurate in rating a student's behavior, significant differences that may exist between the groups being studied could potentially go undiscovered.

Like the Alston and Romney (1992) study, the Anastopoulos et al. (1993) research is potentially biased. This research relies solely on maternal reports without cross-validating the acquired information with the subjects' fathers or by directly observing parent-child interactions.

Although several methodological considerations are noted in the current research, the research has many strengths. This discussion on limitations is not meant to invalidate the research, but rather, to provide a better understanding of the findings. Despite these limitations, the research displays valid and reliable results that support the hypothesis that individuals with ADHD, as well as the parents of children with ADHD, have lower self-esteem than individuals without ADHD and the parents of children without ADHD.

Review of the Literature

Many researchers have studied the self-esteem of individuals with ADHD. In the following section, research on the self-esteem of children, adolescents, and adults with ADHD will be reviewed. Additionally, research on self-esteem in parents of children with ADHD and studies regarding treatment and its effect on self-esteem will be addressed.

Self-Esteem in Children with ADHD

Bussing et al. (1998), Kuhne et al. (1997), and Hoza et al. (1993) each studied self-esteem among children diagnosed with ADHD. Bussing et al.

predicted that children with ADHD who were receiving special education services for Serious Emotional Disturbance (SED) would display more severe ADHD symptoms and a lower self-concept than children with ADHD who were receiving Learning Disability (LD) services. Likewise, Kuhne et al. hypothesized that children with ADHD and a concurrent disruptive behavior disorder, such as Oppositional Defiant Disorder (ODD) or Conduct Disorder (CD), would exhibit a lower self-concept than children diagnosed with having solely ADHD. Lastly, Hoza et al. studied self-perception among ADHD children by comparing these children to a non-referred control group.

Bussing et al. (1998) began their study with 722 eligible participants who qualified for special education services for either Learning Disablities (LD) or Serious Emotional Disturbance (SED). These children were in the second through fourth grades and attended a school district in Florida that included 24 elementary schools.

Bussing et al.'s (1998) research was divided into two phases. In phase one, the parents of the 722 eligible children were asked to complete a telephone interview that included two ADHD screening measures. The parent response rate was 69% (N = 499). Nearly three-fourths of the sample in phase one was comprised of boys (73%); 47% had minority backgrounds; 51% came from single-parent households; and 66% were from low-socioeconomic status (SES) families. The mean age of the children was 9.6 years (SD = 1.0; range = 7-12). Almost

three-fourths of the sample received services for specific learning disabilities (73%), whereas 27% received SED services, including six children who received concurrent SED and LD services. Two-thirds of the school principals (n = 16) granted teacher participation, and those teachers approved to participate completed 80% of the ratings.

Of the 499 screened children, 41% (N = 207) were deemed as being at high risk for ADHD due either to their scores being in the clinically elevated range on both the Abbreviated Symptom Questionnaire (ASQ) and the Attention Deficit Disorders Evaluation Scale (ADDES) or to there being a history of current or past treatment for ADHD. In phase two of the study, 71% of those children classified as being at high risk (N = 148) and their parents participated in a structured interview for the diagnosis of ADHD. The children also completed measures of depression, anxiety, and self-concept. Eighty percent of the participants in phase two were male (n = 119); 45% were from minority backgrounds (n = 67); 51% came from single-parent households (n = 75); 63% were from low-SES families (n = 93); 39% were in SED programs (n = 58); and 61% received LD services (n = 90).

As mentioned, two screening measures were used to assess for ADHD symptoms, the ASQ and the ADDES. The ASQ is a 10-item instrument that has parents or teachers rate the severity of a child's behavioral problems on a four-point scale. A total score is obtained by summing the 10 items and can range from 0 to 30. The raw scores are then changed to gender and age-specific t-scores

(M = 50; SD = 10). High scores indicate greater behavioral problems. The ADDES also has a parent (46 items) and a teacher (60 items) version. The ADDES looks at the frequency of ADHD symptoms, resulting in a total score and subscale scores for hyperactivity, impulsivity, and inattention. Standard scores and percentile ranks are determined. A percentile rank below 15 is considered in the clinical range.

Based on large samples, including minority populations, the reliability and validity for both the ASQ and the ADDES are high. The one-week test-retest reliability on the ASQ ranges from .91 to .98 and the one-month test-retest reliability on the ADDES ranges from .89 to .97. The ADDES also has an internal consistency ranging from .93 to .98. If the parent ASQ score was more than 1.5 standard deviations above the normative reference group (t-score > 65) and the ADDES score was below the 10th percentile of the normal range, the child was declared to be at high risk for ADHD.

The third edition of the Diagnostic Interview Schedule for Children (DISC-3.0) was used in determining the diagnosis of ADHD and possible comorbid conditions. The DISC-3.0 is based on DSM-IV criteria and has moderate to substantial test-retest reliability and satisfactory internal consistency (Crohnbach's alpha for ADHD = .87). After interviewer training, interrater agreement was high and continued to be high even after numerous months of gathering data.

The instrument used to measure the child's level of self-esteem was the Piers-Harris Self-Concept Scale. This scale consists of 80 items, 6 subscales, and 1 composite score. When used with large samples of children, including minority children, the scale exhibits a satisfactory level of test-retest reliability (.71 - .72). High percentiles reflect a high self-concept, while scores below the thirtieth percentile of the normative sample are indicative of low self-esteem.

Significance levels in this study were determined using chi-square test of proportions for categorical variables and analysis of variance (ANOVA) for continuous measures. Children, socioeconomic status, and ethnicity were dichotomized as follows: meeting or not meeting DSM-IV criteria for ADHD, high-SES or low-SES, and non-Hispanic white or minority.

Parents were twice as likely as teachers to report ADHD behaviors in the clinical range on the ADHD screening surveys. Of the 148 high-risk children being studied, 68% (n = 101) met the DSM-IV criteria for ADHD and 15% (n = 22) acknowledged symptoms of low self-esteem. Also, those children who met the DSM-IV criteria for ADHD indicated more symptoms of lower self-esteem than did those children who did not meet the ADHD criteria. These differences were statistically significant ($p < 0.1$).

Bussing et al. (1998) found that among the ADHD children that were receiving special education services, the levels of self-esteem in the LD group (M = 68) and the SED group (M = 63) were almost identical. Additionally, each of

the LD group's and SED group's child-report measures for self-esteem were within the normal range as indicated on the Piers-Harris Self-Concept Scale.

This study has a couple of strengths worth noting. First, Bussing et al. (1998) chose instruments with strong reliability and validity in measuring both ADHD and self-esteem. Second, the study was based on a large sample size with the participants having various SES and ethnic backgrounds.

In addition to these strengths, this study has some limitations. In phase one of the study, only 69% of eligible parents chose to participate and in phase two, 71% of those whose children were at risk for ADHD decided to participate. Consequently, the representativeness of the sample is of some concern. Additionally, it was found that the minority parents were slightly more likely to refuse participation. Despite the parents' decisions on whether to participate, the study sample was representative in the other socio-demographic areas. Even though this study considered SES and ethnicity, it collapsed its comparison groups into dichotomous categories. Consequently, the children fell into either a high or low-SES category and into either a non-Hispanic white or minority category. Unfortunately, the various minorities were not studied independently, and as a consequence, the results cannot be generalized to specific minority groups.

Another limitation is that Bussing et al. (1998) compared LD students with ADHD to SED students with ADHD, but did not have a control group of non-

ADHD children that were either LD or SED students. Therefore, the results of this study cannot be generalized to children other than the types of children studied. Lastly, Bussing et al. studied children that they had access to in the Florida school district. As a result, one must be careful not to generalize the results based on the terms LD and SED because different states may have different criteria determining each of these placements.

Kuhne et al. (1997) also studied children having ADHD and comorbid conditions, but unlike Bussing et al. (1998), Kuhne et al. compared these children to a group of children having purely ADHD diagnoses. Kuhne et al. evaluated baseline data from 91 clinically referred children with ADHD, between the ages of 5 and 12, and their families who previously took part in a treatment study involving stimulant medication and parent training. The diagnoses of ADHD, ODD, and CD were determined via an assessment of the child in conjunction with responses to the Parent Interview for Child Symptoms (PICS) and the Teacher Telephone Interview (TTI). The child's self-esteem was then measured using the Self-Perception Profile for Children. Those children with a Full Scale IQ of less than 80, evidence of a neurological disorder, attendance at a full-time residential or day treatment program, previous treatment with medication for ADHD, a chronic or serious medical problem, or a history of psychosis were excluded from the study.

The PICS and the TTI are similar, semi-structured interviews that study ADHD, ODD, and CD symptoms, among other disorders. The TTI is conducted with teachers by telephone, whereas the PICS is administered to parents, in person. Both instruments ask for in depth descriptions of the child's behavior. The TTI focuses on the child's behavior at school and the PICS evaluates at home behavior. While considering the severity and frequency of the behavior, the clinician rates the child's reported behavior on a 4-point scale. It was reported that the interviewers in this study all had clinical experience and almost 100% interrater reliability with one of the researchers, Dr. Russell Schachar. Both the PICS and the TTI have displayed high interrater reliability and convergent validity.

The Self-Perception Profile for Children (SPPC), used to measure children's self-perceptions about their own self-competence, includes 36 items on which the subjects rate themselves. The instrument includes six domain-specific subscales: Scholastic Competence, Social Acceptance, Athletic Competence, Physical Appearance, Behavioral Conduct, and Global Self-Worth.

The study participants with ADHD were assigned to one of three groups depending on whether they met the specific criteria within the DSM-III-R. The criteria could be met through parent (PICS) or teacher (TTI) report or both. Group one ($\underline{n}$ = 33) was formed with ADHD children having no comorbid ODD or CD (ADHD). Group two ($\underline{n}$ = 46) consisted of children with ADHD and ODD

(ADHD + ODD), and group three (n = 12) contained children with ADHD and CD (ADHD + CD). Any ADHD children having both ODD and CD were placed into group three, ADHD + CD.

Contingency table analyses, dual-proportions testing, and one-way analysis of variance were selected to analyze the data. Additionally, post hoc comparisons were completed on significant findings using the Tukey B test with a $p < .05$.

Kuhne et al. (1997) concluded that there were no significant differences between the three groups in regards to their self-esteem (i.e., global self-perceptions of competence). The ADHD + ODD children did report a higher level of self-perceived competence in the area of athletic abilities when compared to ADHD children, $F(2, 88) = 4.3$, $p < .05$. Additionally, ADHD + ODD children displayed elevated scholastic esteem when compared with the other two groups, $F(2, 88) = 2.6$, $p < .10$. ADHD + CD children, however, reported depressed levels of self-perceived competence in the areas of social functioning, $F(2, 88) = 3.7$, $p < .05$, and behavior, $F(2, 88) = 4.6$, $p < .05$. These children, overall, displayed a pattern of having a lower self-perception in all areas except for their self-perceived athletic abilities which were similar to those of ADHD + ODD children. From these results, it seems as though ADHD + CD children, as well as ADHD + ODD children, obtain a portion of their self-esteem through their

athletic abilities. Lastly, a review of the means shows that ADHD + CD children's perception of their behavior is within the clinical range (i.e., < 1 SD).

The strengths of this study include the fact that Kuhne et al. (1997) chose reliable and valid instruments for diagnosing the children and measuring their self-esteem. It would have been beneficial, though, if Kuhne et al. had stated the psychometric properties of the Self-Perception Profile for Children (SPPC) within the article, rather than having the reader search for this information elsewhere. Another strength of this study is that the researchers appropriately followed through with post hoc testing to determine which means were significantly different and reported these results within the article.

On the other hand, Kuhne et al.'s (1997) study evaluated a small sample of ADHD + CD children (n = 12). Unfortunately, this low number reduces the statistical power, restricting the ability to distinguish this group from others, namely the ADHD + ODD group. Due to the small sample size, one must be careful not to generalize the ADHD + CD results to all ADHD + CD children. Additionally, Kuhne et al. used only clinically referred children in their study and therefore, did not have a comparison group of non-ADHD children. In the future, it would be beneficial if the sample were obtained from the non-referred community, allowing a comparison group of non-ADHD children.

Unlike Kuhne et al. (1997), Hoza et al. (1993) studied 27 boys with ADHD and a comparison group of 25 nonreferred boys, each boy ranging in age from

8.5 to 13 years of age. The boys with ADHD had previously participated in the 1990 Children's Summer Day Treatment Program (STP) at Western Psychiatric Institute and Clinic. The STP was for children with ADHD and other related disorders. The ADHD boys were evaluated at the STP site and each met the DSM-III-R criteria for ADHD as determined by a structured interview with their parents and ratings on the IOWA Conners and the Disruptive Behavior Disorders (DBD) Rating Scale. It was also determined that 12 boys diagnosed with ADHD had comorbid CD, whereas 13 boys had comorbid ODD.

The control group was formed via mailings to parents of school children in Fayette County, Kentucky. Boys with behavior or learning problems, and those that had previously been referred for a mental health problem, as reported by their parents, were excluded from the study. The control boys were screened for ADHD symptoms with the mother version of the Conners Abbreviated Symptom Questionnaire. The boys selected for the control group had scores less than 1 SD above the mean. These boys were tested in their homes, separate from the family activities that were currently taking place.

To assess the children's behavior, their parents were given the Child Behavior Checklist (CBCL) to complete. Additionally, as a means of measuring their self-esteem, the children were asked to complete the Self-Perception Profile for Children (SPPC). The SPPC, described earlier in the Kuhne et al. (1997)

study, has good psychometric properties and it is suitable for children ages 8 and older.

Hoza et al. (1993) analyzed the ADHD group and the control group by initially excluding internalizing t-scores as a covariate, and then by including the internalizing t-scores. When comparing the cohorts on the SPPC without the internalizing scores, the control group (M = 3.10, SD = .62) was found to score significantly higher than the ADHD group (M = 2.6, SD = .78) on the Behavioral Conduct subscale, F (1, 48) = 4.84, $p < .05$. Additionally, the global self-worth scores were almost identical (ADHD: M = 3.30, SD = .54; Control: M = 3.33, SD = .38), F (1, 48) = .04, $p < .05$.

When comparing the cohorts on the SPPC, including the internalizing scores, there was no longer a difference between the ADHD group and the control group on the Behavioral Conduct subscale. Hence, it is possible that the internalizing symptoms of the boys within the ADHD cohort are responsible for the original difference. The reanalysis also exposed a significant difference on the Athletic Competence subscale, whereby the boys in the ADHD cohort (M = 3.24) rated themselves as having greater athletic competence than those in the control cohort (M = 2.70), F (1, 47) = 4.94, p = .03. In addition, the boys in the ADHD group (M = 3.31) described themselves as being more satisfied with their physical appearance than those in the comparison group (M = 2.91), F (1, 47) = 3.08, p = .09.

Based on these results, the boys within the ADHD cohort seem to have higher self-esteem in some areas than those without the disorder. The boys in the ADHD cohort reported having greater athletic competence and being more satisfied with their physical appearance than the boys in the control group. Hoza et al. (1993) stated that these findings could be explained in two different ways. One, it is possible that the boys within the ADHD group view themselves in a positive way as a means of dealing with their disorder and improving their behavior. On the other hand, they may be experiencing distorted perceptions of themselves in which they protect their fragile egos by imagining that they are more successful than others.

This study has some limitations. First, of the 27 boys with ADHD, 25 of them had a secondary diagnosis of ODD or CD. Therefore, the results cannot be generalized to a purely ADHD population because it is not known whether the effects are attributed to the ADHD or to the other comorbidities. Second, all the assessments were gathered at a specific time, limiting the ability to determine any long-term effects of ADHD on self-esteem. It would be beneficial, in future research, if a longitudinal study were conducted to evaluate the effects of ADHD on self-esteem over a lengthy period of time.

Of the three studies designed to measure children's levels of self-esteem, Bussing et al.'s (1998) research was the only one to support the hypothesis that children with ADHD have lower self-esteem than those without the disorder.

Bussing et al. found that children meeting the DSM-IV criteria for ADHD endorsed more symptoms of lower self-esteem than those who did not meet the criteria ($p < 0.1$).

Kuhne et al. (1997), on the other hand, compared children with ADHD to those with ADHD + ODD and ADHD + CD. They found that the children with ADHD + CD had a lower self-perception in all areas (including social functioning and behavior) except in athletic abilities. In the area of athletic abilities, their self-perception was elevated, just as it was in the children with ADHD + ODD. Unfortunately, Kuhne et al. did not have a comparison group of children without ADHD. Therefore, it is uncertain if a non-ADHD cohort would have achieved higher self-esteem scores than the ADHD groups tested.

Lastly, Hoza et al.'s (1993) results opposed Bussing et al.'s (1998) results and the hypothesis of this review. In the Hoza et al. study, the boys with ADHD and either ODD or CD had higher self-esteem in the areas of athletic competence and physical appearance than the boys without ADHD. In sum, additional research is needed to determine whether or not children with ADHD have lower self-esteem than those without the disorder.

Self-Esteem in Adolescents with ADHD

Slomkowski et al. (1995) researched self-esteem among adolescents diagnosed as hyperactive during their childhood, while Alston and Romney (1992) and Unger et al. (1997) studied self-esteem among adolescents diagnosed

with ADD/H and ADHD, respectively. Slomkowski et al. wanted to determine whether self-esteem is an important factor in hyperactive adolescents, while Alston and Romney examined the effects of Ritalin on the self-esteem of children and adolescents with attention-deficit disorder with hyperactivity (ADD/H). Unger et al. also measured symptoms of low self-esteem and ADHD, studying homeless youths and young adults living in Los Angeles, California. Barkley et al. (1991) studied adolescents with ADHD, but did not research self-esteem. Although self-esteem was not specifically addressed, the results of the study explore behavioral adjustment and academic functioning, each of which effect adolescents' views of themselves.

Slomkowski et al. (1995) studied 60 Caucasian males who had been diagnosed as being hyperactive between the ages of 6 and 12 years. These subjects, as children, had displayed behavior problems and were referred by their teachers to a no-cost research psychiatric clinic at the Long-Island Jewish-Hillside Medical Center. The control group consisted of 62 Caucasian males who were recruited from the same medical center. The subjects within the control group had not received a prior diagnosis of hyperactivity and, according to parent reports, had never been referred by their elementary school teachers because of behavior problems.

An adolescent follow-up assessment was conducted on this sample, the average age being 18 years (range: 16-23 years). At the adolescent follow-up, it

was found that 30 adolescents (50%) in the hyperactive group and 23 adolescents (37%) in the control group received diagnoses of ADHD or another mental disorder. The hyperactive and the comparison groups were divided into two groups each, those subjects without a mental disorder in adolescence and those subjects with a mental disorder in adolescence.

To measure the adolescents' levels of self-esteem, the research participants completed an 11-item questionnaire, rating their opinions of themselves as compared to the opinions of others their age. The psychometric properties of this scale have not been published.

The adolescents also completed a 26-item questionnaire. Using a 4-point scale, they rated how often ADHD symptoms occurred over the past six months. Psychologists then conducted a 470-item semi-structured interview called the Teenager or Young Adult Schedule (TOYS) and formulated their diagnoses of a mental disorder in adolescence based on the DSM-III.

Slomkowski et al. (1995) used t-test analyses when comparing the hyperactive group to the control group, analysis of variance (ANOVAs) when the groups were classified on the basis of mental disorder in adolescence, Pearson correlations to ascertain the relationship between self-esteem and hyperactive symptoms, and partial correlations to establish bivariate relationships once other relevant variables were controlled.

When the control group and the hyperactive group were initially compared, the hyperactive cohort had significantly lower self-rated self-esteem (M = 38.29, SD = 4.6) than did the comparison cohort (M = 40.55, SD = 4.4), t (121) = 2.73, p < .01. At the adolescent follow-up, post hoc comparisons revealed that the hyperactive cohort without a mental disorder (M = 38.27, SD = 4.61) had significantly lower self-esteem than the control cohort without a mental disorder (M = 41.02, SD = 4.80), F (3, 119) = 2.91, p < .03. Additionally, Slomkowski et al. (1995) found that in both the hyperactive and control adolescents, self-esteem was negatively correlated with self-rated ADHD symptoms (hyperactive cohort = -.40, p < .01; control cohort = -.30, p < .05). The adolescents with higher self-esteem rated themselves as having fewer ADHD symptoms.

In sum, adolescents who had been diagnosed with hyperactivity in childhood claimed to have lower self-esteem in adolescence than the comparison group. Furthermore, hyperactive subjects, without a mental disorder in adolescence, reported significantly lower self-esteem than the control subjects, without a mental disorder in adolescence. Lastly, in both the hyperactive and the control cohorts, the adolescents with higher self-esteem reported having fewer ADHD symptoms.

These results contradict those found in the Hoza et al. (1993) study which found that 8.5 to 13 year old boys with ADHD perceived their competence and global self-worth to be no worse than that of the controls. There are a couple of

possible reasons as to why the results are dissimilar. First, Hoza et al.'s subjects were children (ages 8.5-13), whereas Slomkowski et al.'s (1995) subjects, at the follow-up, were adolescents (ages 16-23). According to Slomkowski et al., one developmental interpretation of the results could be that a child's self-esteem is fairly stable, whereas an adolescent's may have undergone some damage. Second, the hyperactive cohort in Slomkowski et al.'s study was not comorbid for CD and ODD like many of Hoza et al.'s subjects. Since defiance and lying are characteristic of CD and ODD, it is possible that the ADHD children having those additional diagnoses distorted their self-reports regarding their self-esteem.

The research conducted by Slomkowski et al. (1995) had many positive attributes. The researchers were able to longitudinally study several subjects who had been diagnosed hyperactive as children. Additionally, by dividing the hyperactive group into two groups (adolescents with a mental disorder and adolescents without a mental disorder), the researchers could study the lasting impact of childhood hyperactivity on adolescents' (without mental disorders) self-esteem.

The researchers also had a comparison group of adolescents, some of whom were diagnosed with a mental disorder in adolescence and rated themselves as experiencing ADHD symptoms, making the control group less

than ideal. On the other hand, a portion of the comparison group was pure, having no disorders in adolescence.

Since a portion of the hyperactive group had no mental disorders in adolescence, one must be careful not to generalize the research results to those hyperactive adolescents with mental disorders. Additionally, the study sample consisted of middle-class, Caucasian males. Again, one must be careful not to generalize the findings to the population at large.

Alston and Romney (1992) not only studied the self-esteem of children and adolescents with ADD/H, but also assessed the effects of Ritalin on the youths' self-esteem. Alston and Romney gathered 60 English speaking, male subjects with ADD/H from regular, special education, and resource classrooms in Calgary, Canada, and nearby towns. The subjects were between the ages of 7.5 and 16.5 years, came from various socioeconomic levels, and attended both urban and rural schools. Almost half of the subjects (47%) had repeated at least one grade (n = 28), 29 (48%) attended special education schools due to their disorder and secondary learning difficulties, 10 (17%) attended special education classes within regular schools, and 21 (35%) attended regular classrooms.

Additionally, while attending school, half of the subjects were taking Ritalin. The average age of the medicated children was 9.27 years (SD = 1.15), and the average age of the medicated adolescents was 13.63 years (SD = 1.61). The average age of the nonmedicated children was 9.78 years (SD = 1.19), and the

average age of the nonmedicated adolescents was 14.38 years (SD = 1.38). The youths' parents provided all information regarding the subjects' use of Ritalin.

As a means of confirming the ADHD diagnoses within the sample, teachers were asked to complete the Conners' Teacher Rating Scale-Revised (CTRS-R) and three scales from the Child Behavior Checklist-Teacher Report Form (CBCL-TRF). On the CTRS-R, the teachers rated 28-items on a 5-point scale, determining the degree to which behavioral problems were present in the sample. The CTRS-R's criterion validity and discriminant validity are satisfactory while the test-retest reliability is good (.70-.90). On the CBCL-TRF, the test-retest reliability is satisfactory over 2- and 4-month periods (.77 and .64, respectively). Likewise, convergent and congruent validities are evident. Regarding concurrent validity, when nonreferred children were compared to clinically referred children, the clinically referred children were found to have higher scores on the behavior problem scales.

To assess their self-esteem the children and adolescents were asked to complete the Coopersmith Self-Esteem Inventory (CSEI). The inventory is divided into five subscales: four subscales (a total of 50 items) that assess the perceptions of parents, peers, school, and self, and an 8-item lie scale, measuring defensiveness and test-wiseness. The CSEI has an excellent split-half reliability (.90) and good test-retest reliabilities over 5 weeks (.88) and 3 years (.70).

Additionally, the CSEI has good construct, predictive, discriminant, and convergent validities.

Results of the CSEI indicate that there was a significant drug X age interaction on the total score, F (1, 56) = 4.10, $p < .05$, as well as on two subscales: social self-esteem, F (1, 56) = 8.50, $p < .005$, and academic self-esteem, F (1, 56) = 8.58, $p < .005$. On the social self-esteem subscale, the difference between the older medicated cohort (M = 3.73, SD = 1.16) and the older nonmedicated cohort (M = 5.73, SD = 1.71) was significant, revealing that the older medicated cohort had lower self-esteem. On the other hand, the difference between the younger medicated cohort (M = 5.07, SD = 2.09) and the younger nonmedicated cohort (M = 4.53, SD = 1.64) was not significant, F (1, 56) = .75, $p < .39$. On the academic self-esteem subscale, the difference between the older medicated cohort (M = 3.67, SD = 1.50) and the older nonmedicated cohort (M = 4.00, SD = 2.17) was not significant. However, the difference between the younger medicated cohort (M = 5.53, SD = 2.00) and the younger nonmedicated cohort (M = 3.13, SD = 1.46) was significant, F (1, 56) = 13.23, $p < .0006$, revealing that the younger medicated cohort had higher self-esteem. In sum, medication seems to have a positive effect on younger children's academic self-esteem and a negative effect on older children's social self-esteem.

Alston and Romney (1992) offer some suggestions for what attributes to the discrepancy between older and younger children's social and academic self-

esteem. The difference between older and younger children in their level of social self-esteem may be due to older children's feeling more embarrassed to be taking medication because of the social stigma attached and to the concern over their peers' opinions. Furthermore, it is possible that the difference between older and younger children in their level of academic self-esteem is due to the fact that most adolescents with ADHD, regardless of whether they are taking medication, are behind in academic subjects, have negative views about their future, and have a low desire for occupational achievement (Alston & Romney, 1992).

One positive aspect of this study was the researchers use of tests with strong psychometric properties. On the other hand, this study had several limitations. As mentioned previously in the section on methodological considerations, the subjects in this study were not randomly assigned to the medicated and nonmedicated cohorts, and it is also possible that teacher bias occurred. Rather than relying solely on teacher input, it may have been beneficial to receive parental input regarding the subjects' self-esteem, as well. Furthermore, the study does not account for the fact that the subjects' self-esteem may have been affected by the fact that several of the subjects had repeated a grade, had secondary learning difficulties, and were attending special education classes.

Like Alston and Romney (1992), Unger et al. (1997) also assessed the self-esteem of adolescents. The participants in Unger et al.'s study were either homeless or at imminent risk for homelessness. They were youths and young adults, ages 12 to 23. The participants were considered homeless if their primary nighttime residence was in a supervised public or private shelter, an institution that provides a temporary residence, or a public or private place not ordinarily used for sleeping on a regular basis. The participants were considered to be at risk for homelessness if they were temporarily and inadequately housed in a residence not their own.

Unger et al. (1997) went to great lengths to find a sample representative of the target homeless population in the Hollywood area of Los Angeles. Through survey research, field observation, and service provider census data, Unger et al. located 82 sites known to serve adolescents and young adults. Fifty percent of the areas chosen for sampling, called primary sampling units (PSUs), were fixed sites (e.g., 3 shelters, 6 drop-in locations) and 50% were street sites (e.g., 73 street areas divided into 3-block segments).

Daily, interviewers were given a list of randomly selected PSUs and told to select a potential research participant from the first site. If there were no eligible participants, the interviewers were told to go to the next site until they found someone eligible. To determine eligibility, participants answered an 8-item screening instrument. If eligible to participate in the study, the adolescents

and young adults were asked to complete structured interviews in a nearby coffee shop or fast-food restaurant. When possible, the subjects were interviewed at isolated tables, reducing the likelihood that others would overhear them. The research participants were compensated with a meal, bus tokens, and food vouchers for completing the screening and survey instruments. The final sample (N = 432) represented 84% of those eligible, 78% of those screened, and 74% of those approached.

Self-esteem was assessed using the Rosenberg Self-Esteem Scale. Ten items were rated on a 4-point Likert-type scale, recorded so that higher scores revealed higher levels of self-esteem, and averaged to create a self-esteem scale. Respondents with mean scores below 2.5 were deemed as having low self-esteem and those with mean scores above 2.5 were classified as having high self-esteem. The subjects were also given a 4-item scale found in the Adolescent Diagnostic Interview to assess for symptoms of ADHD. The respondents were considered to have ADHD symptoms if they responded affirmatively to 3 of the 4 items.

In sum, 11% of the studied sample declared having ADHD symptoms and 16% reported having low self-esteem. Additionally, 85% of the respondents with ADHD symptoms and 93% of the respondents with low self-esteem also reported having at least one other mental health problem.

Unger et al.'s (1997) study displayed an in-depth selection process worthy of mention. The researchers put much effort into selecting a sample that was

representative of the homeless population of youth and young adults in Hollywood, California. However, this study had limitations as well. As mentioned previously in the section on methodological considerations, one must be careful not to generalize these results to other homeless populations and it is also possible that self-reporting biases occurred. Unfortunately, due to time constraints, the interviewers did not administer an extensive assessment to determine whether or not the participants had ADHD, instead they used a brief measure to determine the presence of ADHD symptoms. Although the results of this study are of great interest, one must be careful not to assume causation. Those individuals with reported ADHD symptoms may or may not also have low self-esteem and vice-versa. One cannot assume that ADHD symptoms and low self-esteem lead to homelessness or that the reverse is true. Likewise, it was not determined whether the participants have low self-esteem because they are homeless or because they have ADHD symptoms. The uncertainties that arose around this issue of causation were not due to the researchers' design because the study was not intended to answer these questions.

Barkley et al. (1991) studied two groups of adolescents and their mothers. All of the adolescents were between the ages of 12 and 17 years. The first group, consisting of 76 boys and 8 girls ($\underline{N} = 84$), all Caucasian, had been referred to a university medical center clinic. Each of these adolescents met the criteria for ADHD. The second group was the comparison group, comprised of 63 boys and

14 girls (N = 77), all but one were Caucasian. These adolescents were sought through advertisements at the medical center and in a regional newspaper. To qualify for the control group, the adolescents could not meet the criteria for ADHD. Sixteen adolescents within the comparison group were learning disabled (LD) students, obtaining special education services. Since many ADHD adolescents have comorbid learning disabilities, Barkley et al. included the LD students in the comparison group in order to control for possible group differences that could surface during the assessment. After the LD students and the rest of the control group were compared using t-tests to make sure that the two groups, aside from the LD, were equivalent, the groups were combined to form one comparison cohort.

Although Barkley et al. (1991) were not specifically studying self-esteem within adolescents, their assessment offers insight worth mentioning in this review. Barkley et al. provided a thorough assessment of both the ADHD and comparison cohorts, including parental interviews, parent and teacher ratings of the adolescents' behavior, adolescent self-reports, psychological tests, and behavioral observations.

Initially, the mothers in this research project were given a structured psychiatric interview with questions designed specifically for this study. In addition, information was gathered on the frequency of symptoms of ADHD, ODD, and CD based on the criteria provided in the DSM-III-R. Based on chi-

square methods with Yates corrections and a Bonferroni correction, setting the significance of any single statistical test at $p < .002$, more ADHD adolescents met DSM-III-R criteria for ODD ($\chi^2 = 32.1$, $p < .001$) and CD ($\chi^2 = 16.2$, $p < .001$) than did the comparison cohort. Hence, the ADHD adolescents displayed significantly more symptoms of ODD ($M = 4.3$, $SD = 2.0$) and CD ($M = 1.2$, $SD = 1.2$) when compared to the ODD ($M = .04$, $SD = .9$, $t = 13.82$, $p < .001$) and CD ($M = .2$, $SD = .5$, $t = 6.84$, $p < .001$) symptoms of the control group.

Among the parent and teacher ratings, the results of the Child Behavior Checklist (CBCL), completed by the parents, and the Child Behavior Checklist-Teacher Report Form (CBCL-TRF), completed by the adolescents' English and math teachers, are worth noting. Analysis of the CBCL data using t-tests revealed significant results regarding the adolescents with ADHD. It was found that those with ADHD were involved in fewer social activities, had less social competence, and poorer academic performance than did those adolescents without ADHD. Furthermore, the t-test analysis conducted on the CBCL-TRF results also revealed significant findings regarding the adolescents with ADHD. Those with ADHD were rated poorer in school performance and adjustment. It was also found that they experience greater difficulties with social relationships, anxiety, unpopularity, obsessive-compulsive symptoms, immaturity, self-destructive behavior, inattention, and aggression. In sum, the teachers rated the

ADHD cohort as significantly more behaviorally and socially maladjusted than the comparison group.

Additionally, the adolescents rated themselves on the Child Behavior Checklist-Youth Self Report (CBCL-YSR). This checklist, having both excellent internal consistency and reliability, has individuals rate their level of competence and behavioral difficulties. The t-tests revealed significant results in that the adolescents with ADHD rated themselves as having poorer adjustment in activities and social relations, being more unpopular, and as having more conduct problems.

Although the Barkley et al. (1991) study does not specifically address self-esteem, their results imply that the ADHD adolescent's self-esteem has been affected. One cannot conclude that ADHD alone contributes to poorer academic performance, less social competence, and unpopularity, considering many of the tested ADHD adolescents displayed comorbid symptoms. It can be assumed, however, that the ADHD adolescents' opinions about themselves (i.e., their self-esteem) are likely affected by their feelings of unpopularity, difficulties relating socially, and the fact that they are struggling academically.

This study had several strengths including a large sample size (N = 161), use of instruments with above average reliabilities and validities, and a thorough analysis of the data. However, this study also had limitations that have been addressed previously. The sample was comprised mostly of Caucasians, and

several adolescents in the ADHD cohort displayed comorbid symptoms, restricting the generalizability of this study. Furthermore, parental information was gathered from the adolescents' mothers, excluding any paternal input.

In sum, the research conducted on adolescents supports the hypothesis that those with ADHD have lower self-esteem than those without the disorder. Slomkowski et al. (1995) found that adolescents diagnosed with childhood hyperactivity claimed to have lower self-esteem in adolescence than the group of adolescents that were never given such a diagnosis. At the study's follow-up, the hyperactive adolescents without a mental disorder had significantly lower self-esteem than the comparison adolescents without a mental disorder, F (3, 119) = 2.91, $p < .03$.

Although Barkley et al. (1991) did not specifically study self-esteem in adolescents, their research indicated that adolescents with ADHD, and ODD or CD symptoms, are significantly more behaviorally and socially maladjusted than adolescents with ODD or CD symptoms, without the diagnosis of ADHD. The ADHD cohort was viewed as being less socially competent, unpopular, having poorer academic performance, and poorer adjustment in activities and social relationships than the non-ADHD control group. It is likely that the difficulties that the ADHD group experiences has an effect on their self-perception, and in turn, has an effect on their self-esteem, although further research is needed before conclusive statements can be made.

Alston and Romney (1992) and Unger et al.'s (1997) studies provide additional information about adolescents with ADHD and their self-esteem, but unfortunately, their studies do not utilize comparison groups of adolescents without ADHD. Alston and Romney found that medication seems to have a positive effect on younger children's academic self-esteem and a negative effect on older children's social self-esteem. This may be attributed to the social stigma that accompanies taking medication and the fact that adolescents are more affected by peer opinion than are children. In turn, adolescents may be more embarrassed than are children when it comes to taking medication.

Additionally, Unger et al. (1997) found there are many homeless youth in Hollywood, California, who report having ADHD symptoms and low self-esteem. The majority of these youth also have at least one other mental health problem. Unger et al.'s study does not research, however, how many of those homeless youth with the diagnosis of ADHD also claim to have low self-esteem. Nor does the study have a control group of youth without ADHD, as a means of comparing their self-esteem to the ADHD group.

Self-Esteem in Adults with ADHD

Biederman et al. (1993), aware of the existence of ADHD in children, chose to examine adults to see whether an adult diagnosis of ADHD would be valid. Additionally, Dooling-Litfin and Rosen (1997) researched self-esteem in college

students having a childhood history of ADHD, while Ratey et al. (1992) studied a retrospective sample of adults from their clinical practice.

Biederman et al. (1993) studied 84 adults, ages 29.9 to 47.9 years, males and females, referred to Massachusetts General Hospital for the treatment of ADHD. These adults had a diagnosis of childhood ADHD that was supported by a structured interview. In this study the adults were compared to a preexisting study group of referred children with ADHD (N = 140), their nonreferred adult relatives with ADHD (N = 36), and adult relatives (without ADHD) of children without ADHD (N = 207). The preexisting group came from the Massachusetts General Hospital and the Harvard Community Health Plan.

The referred adults with ADHD were evaluated with the same procedures used with the preexisting study group. They were given the Structured Clinical Interview for DSM-III-R (SCID) and a portion of the Schedule for Affective Disorders and Schizophrenia for School-Age Children—Epidemiologic (KIDDIE-SADS-E). Additionally, the Wide Range Achievement Test-Revised (WRAT-R), Gilmore Oral Reading Test, portions of the Wechsler Adult Intelligence Scale, Revised (WAIS-R), the Global Assessment of Functioning Scale of DSM-III-R, and the Hollingshead Four-Factor Index of Social Status were used to assess academic achievement, cognitive functioning, psychosocial functioning, and socioeconomic status.

The subjects were given the diagnosis of adult ADHD if they met DSM-III-R criteria for the diagnosis by age 7 and, if at the time of the assessment, they had at least five of the DSM-III-R ADHD symptoms. Furthermore, the subjects had to acknowledge experiencing chronic ADHD symptoms from childhood to adulthood.

First, the two groups of adults with ADHD were compared to the group of adults without ADHD. Then the two groups of adults with ADHD were compared to the group of children with ADHD. Since the group of children was comprised of males only, this group was compared to only the male adults with ADHD. Lastly, the adult groups with ADHD had significantly more males than the comparison adult group without ADHD. To address this issue, Biederman et al. (1993) statistically corrected comparisons by using the Cochran-Mantel-Haenszel chi-square, for categorical variables, and the type III $\underline{F}$ test for continuous variables. All analyses were two-tailed and $\underline{p} < .01$.

Biederman et al. (1993) found that the referred and nonreferred adults with ADHD were similar to each other. However, these adults were more emotionally troubled and impaired than were the comparison cohort of adults without ADHD. The adults with ADHD also had similar patterns of cognition, psychosocial functioning, and psychiatric comorbidity when compared to the children with ADHD. The retention of these results across patterns of cognition,

functioning, and psychopathology support the validity of the adult ADHD diagnosis.

Two positive aspects of the Biederman et al. (1993) study were the usage of a large sample size (N = 467) and several comparison groups. The referred adult ADHD cohort was compared to all other relevant cohorts (nonreferred adults with ADHD, referred children with ADHD, and adults without ADHD). On the other hand, a drawback of the study was the use of a preexamined group of subjects. As mentioned in the section on methodological considerations, it is possible that some measurements were biased because assessments could not be made blind to the referral status. Additionally, one must be careful not to generalize the results that were based on the comparison of male children with ADHD and male adults with ADHD to the female ADHD population.

Dooling-Litfin and Rosen (1997) also assessed adults with ADHD. However, unlike Biederman et al. (1993), Dooling-Litfin and Rosen researched self-esteem among their subjects. They evaluated 86 undergraduate college students who had been diagnosed in childhood as either ADHD, hyperactive, attention deficit, or hyperkinetic. In addition, this study had a comparison group of 477 randomly selected college students that had no history of childhood ADHD or the related labels. All of the subjects in this study attended an Introductory Psychology course at a university in the Rocky Mountain area of the United States.

This study examined the variation in self-esteem between the college students that noted they were ADHD as a child and those college students without such a diagnosis, by the use of analyses of variance (ANOVA). Furthermore, multiple regression techniques were used to study the contribution of various factors to self-esteem among the cohort of those diagnosed with ADHD as a child.

Dooling-Litfin and Rosen (1997) administered the Rosenberg Self-Esteem Scale, comprised of 10 Likert-type items that assess attitude towards oneself. This scale has construct validity, and the test-retest reliability with college students is .85. The researchers also had the subjects complete the Patient's Behavior Checklist for ADHD Adults. This questionnaire, comprised of 18 Likert-type items, measures current ADHD symptoms. According to Dooling-Litfin and Rosen, although this scale has no available normative data, it is commonly used in clinical settings.

On the Rosenberg Self-Esteem Scale, ANOVA displayed a significant difference between the cohort of college students with a childhood diagnosis of ADHD ($\underline{M}$ = 18.76, $\underline{SD}$ = 6.31) and the control group ($\underline{M}$ = 17.42, $\underline{SD}$ = 5.35), $\underline{F}$ (1, 561) = 4.28, $\underline{p} < .05$. Even when the effects of socioeconomic status, aptitude test scores, and gender were covaried out, those college students with a childhood diagnosis of ADHD (Adjusted $\underline{M}$ = 18.92) still had significantly lower self-esteem than the comparison group (Adjusted $\underline{M}$ = 17.54), $\underline{F}$ (4, 424) = 4.34, $\underline{p} < .05$.

Multiple regression techniques were used to study the factors contributing to self-esteem. Social skills, accounting for 14% of the variance, and symptomatology, accounting for 8% of the variance, were found to be significant predictors of self-esteem ($p < .01$). Thus, those individuals with fewer current symptoms and greater social skills had higher self-esteem.

Although Dooling-Litfin and Rosen (1997) had a large sample size (N = 563) and used a test with good validity and reliability to assess the subjects' self-esteem, their study had two limitations. First, their entire sample came from one specific Introductory Psychology course. One must be careful not to generalize the results of this study to the larger population of ADHD adults. Second, the subjects were placed into groups based on their self-reports of whether or not they had a childhood diagnosis of ADHD. These responses were not confirmed, allowing room for error.

Unlike the other studies in this review, Ratey et al. (1992) gathered information from a retrospective sample of 45 males and 15 females (N = 60), ages 22 to 65, from the total caseloads of three practitioners of varying orientation and specific referral populations. Although ADHD symptoms were noted in the subjects' childhood histories, the subjects had no prior childhood diagnoses of ADHD and were unaware of this disorder.

If the subjects currently displayed symptoms that met DSM-III-R criteria, experienced ADHD symptoms throughout adulthood, and had a childhood

history of ADHD symptoms, they were given the present diagnosis of ADHD. Clinicians, without the aid of structured interviews or other diagnostic tests, made all diagnoses. Furthermore, if the subjects acknowledged meeting 8 of the 14 criteria for ADHD in the DSM-III-R, they were given a retrospective diagnosis of ADHD in childhood.

All subjects had presenting diagnoses that brought them into therapy; therefore none of the subjects was initially treated for ADHD. Their comorbid diagnoses included the following: depression, dysthymia, or cyclothymia (47%); anxiety (15%); eating disorders, sleeping disorders, or somatization (15%); drug abuse (13%); obsessive-compulsive disorder (5%); and antisocial behavior (5%).

The clinicians in this study noted low self-esteem as a presenting problem in their subjects. These subjects, experiencing distractibility and impulsivity, tended to have poor social relations that involved confusion, misunderstanding, and eventually relationship failure, which further contributed to their already low self-esteem. They would avoid intimacy as a means of protecting themselves from expected criticism and rejection.

The clinicians also reported that all of the subjects believed they were different from others; in particular, they viewed themselves as less adequate. The subjects found themselves having difficulty meeting their own expectations, let alone the expectations of others. As children, those subjects who were hyperactive and fidgety were considered troublemakers, and those that did not

perform up to potential, no matter how hard they tried, were labeled "underachiever" (Ratey et al., 1992).

Ratey et al. (1992) stated that the subjects were not diagnosed with ADHD as children due to the following reasons: Their intelligence was above average; they performed sufficiently in school; they worked exceptionally hard; they found strategies to help them cope with their symptoms; or they had access to protective support systems.

Most of the subjects in this study had been in psychotherapy with previous therapists and were referred to as treatment failures. Traditional defense analysis, which focuses on uncovering defenses and altering unrealistic expectations, was found to have further damaged the subject's already impaired self-esteem.

This study is beneficial in that the subjects self-reported various life circumstances and their associated feelings. Much can be learned from a person's developmental history. On the other hand, self-reports can be biased, and this study did not use any psychometric tests to verify the subjects' self-reports or the clinicians' diagnoses. Furthermore, the clinicians made diagnoses retrospectively, also adding to the possibility of bias. It may have been easier for the clinicians to detect ADHD symptoms in their subjects' childhoods because that was specifically what they were looking for. This study is helpful in raising

awareness of adult ADHD, but further empirical research is needed to provide valid and reliable results.

Before one can question whether or not adults with ADHD have lower self-esteem than adults without ADHD, one must determine whether or not the adult ADHD diagnosis is valid. Biederman et al. (1993) conducted a thorough study of referred adults with ADHD, nonreferred adults with ADHD, children with ADHD, and adults without ADHD. Their results support the validity of the adult ADHD diagnosis.

Knowing that adult ADHD exists, Dooling-Litfin and Rosen (1997) were able to study the self-esteem of college students with the diagnosis. Dooling-Litfin and Rosen's results support the hypothesis that adults with ADHD have lower self-esteem than those without the disorder. They found that college students with a childhood diagnosis of ADHD had significantly lower self-esteem than the college students without ADHD, $F(4, 424) = 4.34$, $p < .05$.

Lastly, Ratey et al. (1992) studied adults from their clinical practice. These adults, with ADHD symptoms and additional comorbidities, reported having low self-esteem. Unfortunately, there was no comparison group of adults without ADHD. Therefore, from this study, it cannot be ascertained that adults with ADHD have lower self-esteem than those without ADHD.

Self-Esteem in Parents of Children with ADHD

Johnston (1996), Kottman et al. (1995), and Anastopoulos et al. (1993) studied the parents of children with ADHD. Whereas Johnston focused on feelings of self-esteem and competency among the parents of children with both ADHD and ODD, Kottman et al. looked at parental perspectives on the identification and treatment of ADHD. Lastly, Anastopoulos et al. studied the impact of parent training on parenting self-esteem and competency.

Johnston (1996) studied 48 families that were referred to a parent training program and whose children, ages 5 to 11, had referring diagnoses of ADHD. As a means of confirming the diagnoses, a semistructured parent interview and parent ratings on the ADHD Rating Scale were used. On the ADHD Rating Scale, parents indicated the degree to which ADHD symptoms were present in their children, based on the DSM-III-R criteria. If a child's parents endorsed at least 8 of the 14 symptoms, then the child was considered to have ADHD. Using the IOWA Conners Aggression subscale, Johnston then determined whether the children had lower or higher levels of oppositionally defiant (OD) behavior in addition to their ADHD. It was found that 23 children had lower levels of OD behavior (ADHD-LOD) and 25 children had higher levels of OD behavior (ADHD-HOD).

For a comparison group, Johnston (1996) recruited 33 nonproblem children and their families through advertisements in the newspaper and

community. The children were placed in the comparison group if their parents' ratings were below 9 on the IOWA Aggression subscale or if the t-scores on the Internalizing and Externalizing scales of the Child Behavior Checklist were below 70.

After completing the questionnaires in their homes, the parents of the ADHD children, along with their children, were observed in a laboratory setting. The parent-child interactions were videotaped and then assessed using the Response Class Matrix (RCM). In addition, the parents were asked to report how often the child's at-home behavior was problematic and the severity of these problems. The parent reports were then assessed with the reliable and valid Home Situations Questionnaire.

Parenting self-esteem was measured with the Parenting Sense of Competence Scale (PSOCS), a reliable and valid instrument that assesses the degree to which parents feel satisfied and competent in their role as parents. A univariate analysis of covariance (ANCOVA) was used to compare the parenting self-esteem of the mothers of the three groups (nonproblem, ADHD-LOD, ADHD-HOD). The results indicated that there were significant differences in parenting self-esteem between each of the three groups, $F(2, 77) = 11.35$, $p < .001$. Student-Newman-Keuls post hoc comparisons at the .05 alpha level also confirmed that all three groups significantly differed from each other. The mothers of the ADHD-HOD children reported feeling the least competent as

parents, whereas the mothers of the nonproblem children felt the greatest amount of competency.

Likewise, significant differences were found between the parenting self-esteem of the fathers of the three groups, F (2, 58) = 13.86, $p < .001$. Student-Newman-Keuls post hoc comparisons at the .05 alpha level determined that the three groups significantly differed from each other. As seen with the mothers, the fathers of the ADHD-HOD children reported the lowest levels of parenting competency and the fathers of the nonproblem children, the highest.

These results suggest that these parents' feelings of competence, satisfaction, and self-esteem in the parenting role are challenged by their children's ADHD and OD symptoms. It is also apparent that parents feel differently about being the parents of children with ADHD and either low OD or high OD symptoms. These differences in self-esteem may very well have an effect on the parents' behaviors toward their children (e.g., warmth and responsiveness).

Johnston (1996) used reliable and valid test instruments, appropriate statistics, and post hoc comparisons in this study. However, the study did have a major limitation, no purely ADHD group for which to compare the nonproblem children and the children with ADHD and OD symptoms. The results, therefore, cannot be generalized to the parents of ADHD children without OD symptoms. Without a purely ADHD comparison group, one cannot

say whether the parents' lowered self-esteem is attributed to their children's ADHD symptoms or to their children's OD behavior.

Whereas Johnston (1996) assessed parents of children with ADHD to determine the parents' level of self-esteem, Kottman et al. (1995) questioned parents on their concerns and needs regarding their ADHD children. Kottman et al. mailed surveys to members of a statewide association for parents of children with ADHD. Of the 506 possible respondents, 110 parents (22%) returned the completed surveys. The 25-item survey entitled, "Parental Perspectives on Attention-Deficit Hyperactivity Disorder," asked open-ended questions about parental perspectives and experience regarding ADHD symptomatology, identification, and treatment. In addition, some of the questions pertained to demographics and medical history.

A summary of the characteristics of the respondents and their children with ADHD is as follows: 88% were mothers; 94% were Caucasian; average gross family income was $57,000 (SD = $27,600; range = $18,000-$150, 000); and 84% of the children with ADHD were males. The parents expressed a variety of concerns regarding their ADHD children. Forty-three percent of the parents were primarily concerned with their children's academic problems. Second to academic problems was concern for their children's self-esteem (41%).

One of the survey questions sought recommendations for what to include in a parent training program. Forty percent of the parents thought that training

in specific parenting skills would be beneficial. Their suggestions included building and maintaining the self-esteem of the children, parents, and other family members, as well as learning to treat children as capable, significant, loved, and needed.

This survey is excellent. It reflects the parents' concerns and needs regarding their ADHD children. Unfortunately, the study predominantly represents Caucasian mothers in the middle/upper socioeconomic strata. It is also likely that these parents are more aware and more involved with the issue of ADHD, since each of the respondents was a member of the statewide association for parents of children with ADHD. It seems beneficial to the study of ADHD if this particular study was replicated on a sample representing the population at large.

Anastopoulos et al. (1993) also addressed parent training (PT) when they studied the effects of PT on parenting self-esteem. Anastopoulos et al. assessed 34 children (25 boys and 9 girls, ages 6-11), who met the DSM-III-R criteria for ADHD, and their mothers. The children and their mothers were assigned to either a parent training (PT) group ($n = 19$) or a waiting list, comparison group ($n = 15$). The sample was predominantly Caucasian and of the middle socioeconomic strata. Sixteen children had comorbidities. One had functional enuresis; 1 had overanxious disorder; and 14 had ODD. The sample was selected

from referrals to a university medical center that specialized in the identification and treatment of ADHD.

A semistructured psychiatric interview, the Child Behavior Checklist (CBCL), the ADHD Rating Scale (ADHDRS), and the Home Situations Questionnaire-Revised (HSQ-R) confirmed the ADHD diagnoses and their levels of severity. All of these were completed by the children's mothers. Additionally, to measure parenting self-esteem, the mothers completed the Parenting Sense of Competence Scale (PSOCS).

Those subjects within the PT group met for nine sessions on a weekly basis. Although the sessions were open to both parents, only the mothers were required to attend. Both the PT and control groups were assessed prior to beginning PT or entering the waiting list. The PT group was then assessed 1 week following the active phase of treatment, and again, 2 months later as a follow-up. The comparison group was reassessed approximately 2 months after their initial assessment. The control group did not receive a third assessment due to ethical reasons, but rather was placed into PT when it was opportune.

The PSOCS Total means and standard deviations were as follows for the PT group: Pretreatment ($\underline{M}$ = 59.0, $\underline{SD}$ = 8.7); Posttreatment ($\underline{M}$ = 71.1, $\underline{SD}$ = 7.6); and Follow-up ($\underline{M}$ = 69.3, $\underline{SD}$ = 8.0). For the waiting list group, the means and standard deviations were as follows: Pretreatment ($\underline{M}$ = 60.0, $\underline{SD}$ = 12.1) and Posttreatment ($\underline{M}$ = 59.2, $\underline{SD}$ = 12.8). In order to determine the therapeutic

impact of PT, 2 (Control Group) X 2 (Time Period) repeated-measures ANOVAs were conducted with an alpha level of $p < .01$. Significant interaction effects were found for the PSOCS Total, $F(1, 32) = 27.44$, $p < .001$. With the use of a t-test, the two groups were found to be considerably different on the PSOCS Total at posttreatment, $t(32) = 3.38$, $p < .01$. In sum, the PT mothers reported having significantly more parenting self-esteem.

When the PSOCS Total for the PT group and the control group were assessed in regards to clinical significance, it was revealed that 26% of the subjects in the PT group displayed reliable change with recovery, whereas none of the subjects in the control group exhibited change, $\chi^2(2) = 11.94$, $p < .01$. When the PT group was reassessed 2 months after the treatment, the clinical significance of their PSOCS Total scores were as follows: 37% of the subjects exhibited a reliable change with recovery, 47% displayed a minimal change, and 16% had either not changed or had gotten worse. These results indicated that the level of parenting self-esteem within the PT group was maintained over time.

As mentioned in the section of methodological considerations, this study has a few limitations. To begin with, the sample was predominantly Caucasian and middle class, limiting the ability to generalize the results to the greater population, including minorities. Also, the assessments were based on maternal input, without reports from the subjects' fathers or direct observation. This creates the opportunity for possible reporter biases. Lastly, one cannot say with

complete certainty that the differences between the PT group and the control group were due to parent training. It is possible that the subjects in the PT group were in constant contact with a therapist, and that in and of itself may have had an influence on the reported differences. Despite these weaknesses in the study design, results indicate that PT can be therapeutically beneficial for parents of ADHD children.

Johnston (1996), Kottman et al. (1995), and Anastopoulos et al. (1993) studied parents of ADHD children. Johnston found that the parents of children with ADHD, and a high level of oppositionally defiant symptoms, reported feeling the least competent as parents, whereas the parents of children without ADHD felt the greatest amount of competency. Assuming a concordance between self-esteem and competence, Johnston's results support the hypothesis that parents of children with ADHD have lower self-esteem than parents of children without the disorder.

Kottman et al.'s (1995) study revealed that parents of children with ADHD are concerned about their children's self-esteem. In addition, the study found that these parents believe that parent training would be beneficial to them, especially if they are taught how to build and maintain the self-esteem of their children, themselves, and other family members.

Regarding parent training (PT), Anastopoulos et al. (1993) compared a treatment group of mothers of children with ADHD who were receiving PT to a

control group of mothers of children with ADHD who were placed on a waiting list. In sum, the mothers receiving PT reported having significantly more parenting self-esteem than the comparison group. Furthermore, their self-esteem was maintained two months after treatment.

Additional Studies on Treatment and Its Effect on Self-Esteem

Many researchers have studied various types of treatment for children with ADHD and have reported whether the treatment has been effective in improving the children's self-esteem. Wright (1995) evaluated treatment for CD boys, several of whom had additional diagnoses of ADHD, in a cognitive-behavioral social skills training program. Additionally, Goldhaber (1991) studied the effects of a multimodal summer day treatment on the self-esteem of children with ADHD. The multimodal approach included cognitive and behavioral therapies, medication, and structured activities.

Grizenko and Sayegh (1990) evaluated treatment for children with behavior problems, including those with ADD, who also had been admitted to a program that offered a multimodal approach to therapy. This study's major weakness was that the treatment group was not compared to a control group. Grizenko et al. (1993a) later replicated the study by assessing children from the same day treatment program and comparing them to a control group. In addition, the researchers provided a 6-month follow-up assessment on the children. Once again, Grizenko et al. (1993b) compared children from the

previously described day treatment program to children receiving outpatient treatment. Grizenko's 1997 study evaluated children from the aforementioned day treatment program and compared the group at admission, discharge, and a 5-year follow-up.

The Wright (1995) study involved 28 preadolescent males between the ages of 8 and 11 years. These boys were in a specialized residential treatment program known as the Eden House in which they were members of the Social Skills Development Group (SSDG). Every subject had CD as his primary diagnoses, and 85% had an additional diagnosis of ADHD, with or without a learning disability. The goals of the SSDG were to increase the subjects' social skills, self-esteem, and self-control. The boys had Eden House consultants and residential counselors who not only educated the preadolescents, but also acted as role models for the youth. To aid in increasing the boys' self-esteem, the youth were required to assess their own behavior and reinforce themselves when they had done well.

Every three months, the boys were given the Piers-Harris Self-Concept Scale to measure their level of self-esteem. Between January 1986 and February 1990, the 28 subjects were dismissed from Eden House. There was a significant difference between the subjects' scores on the Piers-Harris at admission, as compared to at discharge ($p < .001$, two-tailed test). The boys reported much higher self-esteem upon departure, than upon arrival. Additionally, statistical

significance was found, at both admission and discharge, between the correlation of locus of control and self-esteem. Internal locus of control was linked with higher levels of self-esteem, whereas external locus of control correlated with lower levels of self-esteem.

In sum, although the social skills training program at the Eden House seems to be producing promising results as far as increasing the children's self-esteem, this study did not assess a comparison group. It is possible that the noted changes in self-esteem were due to maturation, although it is highly unlikely, considering the severity of the children's disorders. Furthermore, with the absence of a comparison or alternative treatment group, one cannot assess the effectiveness of this treatment program as compared to others.

This study displayed other limitations. For one, the individual Piers-Harris scores were not reported, leaving the reader to rely on vague conclusions. Second, the subjects had CD as their primary diagnoses and ADHD as their secondary diagnoses. Therefore, the generalization of these results to children with the primary diagnoses of ADHD would be prohibited.

The Goldhaber (1991) study assessed children enrolled in a treatment program dedicated to the same goals as those of the Eden House. Goldhaber evaluated eight children with primary diagnoses of ADHD while they were attending a summer day treatment program. Among several other goals, this program was designed to improve the children's social skills. Parents and

teachers of the children were asked to complete both the ACTeRS and the Conners rating scales. The Conners was used to measure hyperactivity, while the children's levels of attention, hyperactivity, social skills, and oppositional behavior were scored on the ACTeRS. Children with scores at or above 1.6 on the Conners and at or below the 20th percentile on the ACTeRS were included in the study. Additionally, it was found that each child had a secondary diagnosis of ODD, CD, or depression.

The children attended the program Monday through Friday, 8 hours a day, for 8 weeks. The program included social skills training, group therapy, occupational therapy, recreational therapy, monitored play, and individualized academic instruction. The program was based on a cognitive and behavioral approach. Each child had an individualized treatment plan. Behavior management charts, point sheets, time outs, and long-term rewards (e.g., field trips) were implemented. The assumption of the program was that improved social skills and accomplished goals would lead to an increase in the children's self-esteem.

Each week the children were rated with the ACTeRS scale and on the eighth week, the Conners scale was given. Ten weeks after the program concluded, the parents of the children were asked to complete both the ACTeRS and the Conners scales. Over the 8 weeks, significant improvements were noted on the Conners ($t = 2.95$, $df = 7$, $p < .05$) and the hyperactivity ($t = 3.55$, $df = 7$, $p <$

.01) and attention ($t = 3.13$, $df = 7$, $p < .02$) scores of the ACTeRS. Significant improvements were also seen in the social skills ($t = 4.37$, $df = 7$, $p < .01$) and oppositional ($t = 4.05$, $df = 7$, $p < .01$) scores of the ACTeRS.

Increases in the children's self-esteem were noted as well. Although no specific instrument was administered to assess the children's self-esteem, improvement was determined based on observation. The increase in self-esteem seemed to correlate with improved relationships and accomplishments in recreational activities. At the follow-up, both parents and teachers commented that the children's self-esteem and self-confidence had increased; and, since their return to school, the children had more friends.

This study had a small sample size ($N = 8$) of ADHD children with secondary diagnoses. Both of these limitations affect the generalization of the results to a larger, strictly ADHD, population. Additionally, Goldhaber (1991) addressed self-esteem in the article, yet failed to assess the children's self-esteem with appropriate instruments. The reader was left to rely on the possibly biased self-reports of the researcher, teachers, and parents. Lastly, this study did not have a control group with which to compare the treatment group. On the other hand, one of the strengths of this study is the comparison of weekly assessments, in addition to collecting follow-up data. This is an excellent means to plot the treatment effects on the children's behavior.

Grizenko and Sayegh (1990), Grizenko et al. (1993a, 1993b), and Grizenko (1997) also studied children receiving multimodal therapy. Each study was conducted with children who attended the Lyall Preadolescent Day Treatment Program at Douglas Hospital in Quebec. The children were referred to the treatment program because they had disruptive behavior problems that interfered with their ability to function in both the home and school environments. The children attended daily group therapy and also received two and one half hours of special education and three hours of therapeutic intervention each day. Additionally, they received one hour per week of individual play therapy, social skills and task training, psychodrama, pet therapy, art therapy, and occupational therapy. Once a week, all of the families participated in a combined systemic, educational, and behavioral approach to family therapy. The treatment goals varied depending on the needs of each child, but they frequently included increasing the child's self-esteem.

In each study, the children were evaluated with the Hare Self-Esteem Scale (HSES) and the Hopelessness Scale for Children (HSC), among other psychological instruments. The HSES is a 30-item self-report scale that assesses peer, school, and home self-esteem. This scale has good concurrent validity, correlating at .83 with both the Rosenberg Self-Esteem Scale and the Coopersmith Self-Esteem Inventory. Scores on the HSES that are below 90 are considered to be in the problem range. Furthermore, each of these studies

administered the HSC, a 17-item self-report scale of which high scores (> 5) have been shown to be associated with low self-esteem.

Grizenko and Sayegh (1990) studied 21 boys and 2 girls (N = 23) with a mean age of 9. The children were referred from family, school, and outpatient services (n = 20, 87%) and from inpatient and other day treatment programs (n = 3, 13%). Seventeen children had been diagnosed with ODD with or without ADD, 3 with CD, and 3 with depression with somatization disorder or obsessive-compulsive disorder.

Grizenko and Sayegh (1990) chose a pre-/post-test design and used a paired t-test to compare the scores. The post-test scores on the HSES (M = 100.9, SD = 13.4) were significantly higher than the pre-test scores (M = 79.4, SD = 18.3), $p < .0001$, indicating that the children reported much higher self-esteem at discharge than at admission. Likewise, the post-test scores on the HSC (M = 2.0, SD = 2.0) were significantly higher than the pre-test scores (M = 5.4, SD = 3.3), $p < .0001$, revealing that the children reported high levels of hopelessness when they first entered the treatment program, but significantly lower levels at discharge.

The limitations to this study include a lack of a comparison group, a small sample size of ADD children with or without ODD, and the lack of follow-up. Without a control group, one cannot be certain that the children's self-esteem and feelings of hopelessness improved due to the day treatment program. For

example, the positive changes that occurred may have been an effect of maturation or the passage of time. Additionally, with such a small sample size (n = 17), the results cannot be generalized. Also, the study was conducted with children who had ADD and possibly ODD; therefore the results cannot be generalized to a solely ADD population. Furthermore, with the absence of follow-up measures, one cannot assume that the changes in self-esteem and hopelessness will be maintained over time.

Grizenko et al. (1993a) conducted a study of both a treatment group and a control group, evaluating the children at intake, discharge, and a 6-month follow-up. Grizenko et al. studied 23 boys and 7 girls (N = 30) with a mean age of nine. The children were referred by their school administration (60%), by a social worker or by outpatient services (37%), and by another day treatment program (3%). The treatment group contained 5 children with ADHD, 9 with ODD, and 1 with CD. The control group had 3 children with ADHD, 9 with ODD, 2 with CD, and 1 with adjustment disorder with disturbance of conduct. The groups were found to be similar at intake with the exception of age. The children in the control group were younger than in the treatment group.

With regards to self-esteem and levels of hopelessness, intake scores for both the treatment cohort (HSES: M = 73, SD = 13.7; HSC: M = 7, SD = 2.1) and the comparison cohort (HSES: M = 79, SD = 10.9; HSC: M = 5, SD = 3.4) were in the problem range. At discharge, the treated children had scores within the

normal range (HSES: $\underline{M}$ = 93, $\underline{SD}$ = 13.2; HSC: $\underline{M}$ = 4, $\underline{SD}$ = 2.1), whereas the control group scores remained in the problem range (HSES: $\underline{M}$ = 82, $\underline{SD}$ = 9.3; HSC: $\underline{M}$ = 6, $\underline{SD}$ = 4.3).

When a MANCOVA was conducted, using Hotelling's T^2 criterion, significant differences between the intake and discharge scores on the HSES and the HSC for both the treated and control groups were found, $\underline{F}$ = 8.16, $\underline{df}$ = 3, 22, $\underline{p} < .001$. Additionally, the multimodal day treatment program was found to have a significant effect on the treated children's self-esteem and feelings of hopelessness, $\underline{F}$ (HSES) = 25.0, $\underline{p} < .0001$; $\underline{F}$ (HSC) = 11.03, $\underline{df}$ = 1, 24, $\underline{p} < .002$. At follow-up, the scores of the treated children remained in the normal range (HSES: $\underline{M}$ = 94, $\underline{SD}$ = 12; HSC: $\underline{M}$ = 4, $\underline{SD}$ = 2.5). In sum, the treatment group experienced significant changes that remained even at the 6-month follow-up. The treated children, when compared to the control group, reported feeling less hopeless with greater self-esteem.

This study improved on the Grizenko and Sayegh (1990) study in that it included a comparison group and a short-term follow-up. As mentioned in the section of methodological considerations, the greatest limitation to this study was that the groups were sequentially rather than randomly assigned, possibly affecting the comparability of the groups. Also, because of the small sample size of children with ADHD, the results may not generalize to the greater ADHD population.

Next, Grizenko et al. (1993b) studied 30 children who were placed into either a day treatment group (13 boys and 2 girls) or an outpatient treatment group (11 boys and 4 girls). Both groups had a mean age of 9. The children were referred to treatment by their parents, social workers, and school psychologists. Each group had 4 children with ADHD and ODD and 11 children with ODD. The groups were compared using a mixed model design with repeated measures at intake and discharge.

The children's self-esteem and level of hopelessness within the day treatment group improved from the initial measures taken at admission (HSES: $M = 81.7$, $SD = 10.1$; HSC: $M = 6.7$, $SD = 3.4$) to those taken at discharge (HSES: $M = 91.3$, $SD = 7.7$; HSC: $M = 2.8$, $SD = 2.5$). On the other hand, the children's self-esteem and level of hopelessness remained in the problem range for the outpatient group. Their discharge scores (HSES: $M = 90.9$, $SD = 8.5$; HSC: $M = 4.6$, $SD = 2.9$) were insignificantly higher than the intake scores (HSES: $M = 89.5$, $SD = 7.3$; HSC: $M = 4.9$, $SD = 2.3$). A univariate F test determined a significant group effect for the HSC scale between the two groups, $F = 4.35$, $df = 1, 25$, $p < .05$. In sum, day treatment was more effective at improving the children's self-esteem and reducing their feelings of hopelessness, than was the outpatient treatment.

Although this study had a comparison group, it did not provide follow-up assessment. Just because improvements were found in the day treatment group

does not mean that these improvements will remain in months or years to come. This study has limited generalizability due to the small sample size. Additionally, the children with ADHD had comorbid diagnoses of ODD. Therefore, the results are not generalizable to children having single ADHD diagnoses.

Grizenko's 1997 study included 30 boys and 3 girls (N = 33) attending the Lyall Preadolescent Day Treatment Program. This time, the children were tested at intake, discharge, and 5-year follow-up. Upon initial testing, the children were between the ages of 5 and 12. At follow-up, the average age was 13 years (SD = 2.0). When the study began, 67% of the children had the diagnosis of ODD, 18% had ADHD, and 15% had CD. The diagnoses were based on the initial evaluation, school records, and information from the referral source. The children were referred to the day treatment program by their schools (52%), social services (15%), outpatient programs (30%), and parents (3%). At the time of follow-up, 8 of the children were lost to attrition.

As in the previous studies conducted by Grizenko and associates, the children's self-esteem and level of hopelessness were measured with the HSES and the HSC. In order to evaluate the admission scores verses the 5-year follow-up and the discharge scores verses the 5-year follow-up, a repeated-measures analyses of variance was conducted. One child refused to participate in the self-

rating process. Therefore, only 32 children were evaluated with the HSES and the HSC.

On the HSES, improvement was made between the admission score (M = 73, SD = 13.9) and the 5-year follow-up score (M = 87.3, SD = 12.1), although the scores remained in the problem range, F = 19.21, $p < .001$. There was deterioration, however, between the discharge score (M = 102.9, SD = 14.1) and the 5-year follow-up score (M = 87.3, SD = 12.1), F = 27.0, $p < .001$. Thus, the children's self-esteem increased upon receiving treatment, but that increase was not maintained 5 years later. Although their self-esteem was still problematic at the 5-year follow-up, it was slightly better than when they began the study.

On the HSC, the children's admission scores (M = 6.0, SD = 2.5) went from being in the problematic range to being in the normal range at the 5-year follow-up (M = 3.1, SD = 2.7), F = 24.15, $p < .001$. An insignificant degree of deterioration occurred between the discharge score (M = 2.2, SD = 1.8) and the 5-year follow-up score (M = 3.1, SD = 2.7), F = 2.8. Hence, the children's feelings of hopelessness at admission to the study were no longer problematic at discharge or at the 5-year follow-up.

Due to ethical reasons, this study did not have a control group. As a result, one cannot attribute all of the children's improvements, regarding feelings of hopelessness, to the day treatment. It is also possible that maturation, the passage of time, or a placebo effect was responsible for decreasing the children's

feelings of hopelessness. In addition, for the purposes of this review, this study was limited by the small sample size of children with ADHD ($n = 6$). Thus, caution should be used when generalizing the results to the ADHD, ODD, and CD populations.

Despite the limitations of this study, it does have several strengths. This study used psychometric instruments with good validity and reliability. Furthermore, the treatment method is generalizable to other settings. Lastly, to aid in tracking the success rate of the treatment program, a long-term follow-up was conducted.

Upon reviewing the research conducted on the various treatments for children with ADHD, it seems as though a multimodal approach is effective for increasing children's self-esteem. Wright (1995) found a social skills training program to be successful at increasing the self-esteem among boys who had a primary diagnosis of CD and comorbid diagnosis of ADHD with or without LD. Since no follow-up was conducted, the permanent success of the program is uncertain.

Goldhaber (1991) found that a multimodal summer day treatment program that offered a cognitive-behavioral approach was successful at increasing the self-esteem of children with ADHD and comorbidites. According to reports by parents and teachers, the increase in self-esteem was maintained and as a result, the children had more friends when they returned to school.

Additionally, Grizenko and Sayegh (1990) and Grizenko et al. (1993a, 1993b) found multimodal treatment to be successful at increasing the self-esteem of children with ADHD and ODD. Their approach included various forms of therapy, special education, therapeutic intervention, and social skills and task training. Grizenko and Sayegh reported significant improvement with respect to the ADHD children's self-esteem and feelings of hopelessness when their initial test results were compared to those at discharge.

Grizenko et al. (1993a) compared a treatment group to a control group and found that the treatment group's self-esteem and feelings of hopelessness were in the problem range at intake and in the normal range at discharge and at the 6-month follow-up. On the other hand, the control group's scores were in the problem range at intake and remained there at discharge.

Grizenko et al. (1993b) had similar results to the Grizenko et al. (1993a) study. The treatment group's self-esteem and level of hopelessness improved from the problem range to the normal range from admission to discharge, whereas the outpatient group's scores remained in the problem range throughout the study.

Lastly, Grizenko (1997) conducted a 5-year follow-up study on children in the aforementioned multimodal day treatment program. Although the children's self-esteem improved during treatment, the results were not maintained at the follow-up. This raises the question of what are the best

treatment plans for developing and maintaining children's self-esteem over time. More research needs to be conducted in this area.

Conclusions

Not much research has been conducted to assess the self-esteem of individuals with ADHD compared to those without the disorder. From the studies that have been done, it is apparent that self-esteem is affected by ADHD with or without comorbid diagnoses. According to the current research, some children with ADHD were found to have lower self-esteem than were children without the disorder (Bussing et al., 1998). Conversely, some children with ADHD and comorbid symptoms were found to have higher self-esteem in some areas than were children without the disorder (Hoza et al. 1993). It is possible that children with ADHD and comorbid symptoms view themselves in a positive way as a means of coping with their disorder. On the other hand, these children may be experiencing distorted perceptions of themselves in which they protect their delicate egos by imagining that they are more eminent than others. Although the research conducted on children with ADHD has produced conflicting results, the research conducted on adolescents and adults with ADHD has been conclusive. Adolescents and adults with ADHD have lower self-esteem than do adolescents and adults without the disorder (Dooling-Litfin & Rosen, 1997; Slomkowski et al., 1995). It is important for clinicians to recognize that

ADHD affects self-esteem at all ages because this knowledge can alter the treatment plans that are presently being administered to individuals with the disorder.

Clinical Application and Treatment Suggestions

As clinicians, it is important to educate individuals with ADHD about the disorder. Education and understanding create a sense of power and control of one's own life. Individuals with ADHD often feel a loss of control; therefore, any information about the disorder can be beneficial in allowing them to regain some of the control they perceive to have lost. Individuals with ADHD should be made aware that they are not the only ones with this disorder and that they do not have to struggle by themselves. Rather, there are several others going through the same trials, and there are support groups which can help (e.g., family, school staff, others with ADHD). Education should be provided at all age levels, from children to adults, and the explanation of the disorder should be tailored to the diagnosed individual's age.

Those with ADHD need to know that it is acceptable to ask for assistance. Often children and adolescents with ADHD have poor organizational skills that become quite apparent in the school setting. Their self-esteem may decrease due to the confusion and forgetfulness they may display. However, by asking for assistance, they can potentially learn to become more organized and less forgetful. It may be beneficial to the ADHD individual to have a peer in the

classroom whom he can ask for assistance when homework, tests, and projects become overwhelming. In some cases, ADHD individuals could benefit from someone writing down their homework assignments and checking to make sure that they are bringing home the appropriate textbooks.

Children with ADHD have a tendency to experience behavioral difficulties. As a consequence, the children should never be told that they are bad, for this has a prolonged effect on self-esteem. Instead, it should be explained to them that their behavior was inappropriate. Then, suggestions should be given for more appropriate behaviors, given the same circumstances. To boost the child's self-esteem, the child can be included in brainstorming appropriate behaviors.

Some children with ADHD and other comorbid symptoms have described themselves as feeling competent with their athletic abilities, physical appearance, scholastic esteem, and social and behavioral functioning (Hoza et al., 1993; Kuhne et al., 1992). If an ADHD child is accurate in perceiving himself to be athletically competent, then participation in a sport should be helpful in sustaining a higher level of self-esteem. On the other hand, if the child is experiencing a distorted perception of himself, a confirmation of reality may be necessary. For example, if a child does not perceive himself to be exhibiting behavioral difficulties on a consistent basis, yet his teacher does, the child will need to be made aware of his problematic behavior and its effect on others.

There are a variety of techniques that have been found to be helpful in increasing the self-esteem of children and adolescents with ADHD. As mentioned earlier, a multimodal approach to treatment has proven effective, but more research is necessary to determine the longitudinal effects of the treatment (Goldhaber, 1991; Grizenko, 1997; Grizenko et al., 1993a, 1993b; Grizenko & Sayegh, 1990; Wright, 1995). Both children and adolescents with ADHD can benefit from the following: social skills training; individualized academic instruction; individualized treatment plans including behavior management charts, point sheets, time-out, and short-and long-term rewards; communication techniques in which one learns how to appropriately communicate his feelings; group therapy; family therapy; psychodrama; pet therapy; and art therapy. Also, children with ADHD can benefit from individual play therapy, whereas adolescents with ADHD can be aided through occupational therapy. When a child with ADHD is old enough to understand right from wrong, it is additionally helpful to allow him to assess his own behavior and reinforce himself when he has behaved appropriately. This gives the child a sense of responsibility and control, and in turn, can help to increase his self-esteem.

Treatment including medication is also an option. In fact, treatment with stimulant medication is the most frequently utilized intervention for children with ADHD. Stimulant medication has been more effective than all other treatments, combined. Hence, it has become a measure by which other

interventions are compared (Safer & Krager, 1984). Although 10% to 30% of children with ADHD do not benefit from psychostimulants, as many as 70% to 80% of medicated children with ADHD, experience improvements with their attention span, impulse control, academic productivity, social relationships, and compliance with authority-figure commands (DuPaul & Barkley, 1990; Pelham, 1993; Pelham & Murphy, 1986). These improvements in behavior, scholastic performance, and social relationships can lead to an increase in children's self-esteem. Stimulant medication allows children with ADHD to become more manageable and attentive in the short-term. However, the long-term beneficial effect of psychostimulants on learning and academic achievement is inconclusive, requiring further research (Swanson, Cantwell, Lerner, McBurnett, & Hanna, 1991).

The central nervous system stimulant drug, Ritalin, has been found to allow children with ADHD to focus while in the classroom which has led to an increase in academic self-esteem. On the other hand, for adolescents with ADHD, Ritalin has been found to lower social self-esteem. The adolescents' social self-esteem may be affected by the stigma that is attached with taking medication, embarrassment, and concern with peer opinion (Alston & Romney, 1992).

Adolescents with ADHD, like children with the disorder, can benefit from social skills training and group therapy. Since adolescents are even more

concerned about peer opinion than children, group therapy can be exceptionally helpful. Within the group, the ADHD adolescent has an opportunity to see that he is not alone. The group is an excellent source of support and a "safe" environment in which those with ADHD can discuss their feelings about having the disorder and deal with issues such as behavior difficulties, anxiety, and unpopularity. Within the group, adolescents with ADHD can explore appropriate social interaction and receive immediate feedback. Interactions within the group can assist and prepare adolescents with ADHD for their social relationships in everyday life (Barkley et al., 1991).

It is possible for adolescents and adults to have childhood diagnoses of ADHD, but no longer have ADHD in adolescence or adulthood. In fact, research has found that these adolescents and adults can potentially continue to have low self-esteem. Therefore, follow-up procedures that assess the individuals' current self-esteem should be implemented and appropriate treatment (e.g., individual or group therapy) should follow.

Adults with ADHD can benefit from many of the same treatments offered to adolescents with ADHD (Biederman et al., 1993; Ratey et al., 1992). Adults with ADHD may find social skills training and group therapy helpful. Within the group, the adults can experiment with social interactions and discuss such issues as intimacy, expectations of themselves and others, and how their disorder affects them at home and at work.

As with all major events in a child's life, the parents of children with ADHD need to become involved in the treatment process. These parents need to provide a supportive environment in the home and be willing to work in conjunction with school staff. Additionally, parents of children with ADHD need to be aware of how the disorder can impact their behavior toward their children. It is possible for these parents to become frustrated with their child's behaviors and unconsciously display less warmth and responsiveness to their ADHD children. Therefore, parents need to be educated as to how their child's disorder affects them as parents. Furthermore, parents of children with ADHD must not assume that their child's misbehavior is attributed to "bad" parenting, for this will lead to a lower self-esteem in parents.

The research shows that parents desire to be informed and educated about their children's disorder. The parents' self-esteem, like their children's, is affected by their children's ADHD. Parent training is an excellent means to inform, educate, and aid the parents of children with ADHD. Through parent training, parents can learn specific parenting skills, how to increase and maintain the self-esteem of their ADHD child, themselves, and other family members, and how to treat their ADHD child as capable, important, and loved (Kottman et al., 1995). Parent training can ultimately assist in increasing the self-esteem of children with ADHD and their parents (Anastopoulos et al., 1993). In addition to parent training, attending a support group for parents of children with ADHD

can be another beneficial form of treatment to increase the parents' sense of competency in their parenting roles (Johnston, 1996).

Research Suggestions

To further assess self-esteem in individuals with ADHD and self-esteem in the parents of those with ADHD, additional research needs to be conducted. Based upon a review of the current research, one can determine what is required to construct a reliable study that offers valid results.

First, it is necessary to select a large sample so that the study will have high statistical power. Second, the sample should consist of males and females of various ages, from diverse ethnic and socioeconomic backgrounds. With the proper selection of subjects, the results of the study can be generalized to the larger population. Third, it is important to study individuals with the solitary diagnosis of ADHD and compare them with a randomly selected control group. Fourth, the selected test instruments must have good psychometric properties to produce valid and reliable results and proper statistical analyses must be performed on those results. Finally, it is imperative that longitudinal research be conducted so that long-term effects can be determined and treatments with lasting effects can be developed.

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